GUL', V.Ye.; PENSKAYA, Ye.A.; KULEZNEV, V.N.; ARUTYUNOVA, S.G.

Estimation of the compatibility of polymers. Dokl. AN SSSR 160 no.1:154-157 Ja '65. (MIRA 18:2)

1. Moskovskiy tekhnologicheskiy institut myasnoy i molochnoy promyshlennosti i Moskovskiy institut tonkoy khimicheskoy tekhnologii im. M.V. Lomonosova. Submitted June 16, 1964.

L [illegible]-66 EWT(m)/EWP(j)/T IJP(c) WW/DS/RM

ACC NR: AP6022446 (A) SOURCE CODE: UR/0069/66/028/002/0229/0233

44
42
B

AUTHOR: Igumnova, A. V.; Dogadkin, B. A.; Kuleznev, V. N.

ORG: Institute of Fine Chemical Technology im. M. V. Lomonosov, Moscow (Institut tonkoy khimicheskoy tekhnologii)

TITLE: The influence of branched structures on the physical-mechanical properties of vulcanized natural rubber

SOURCE: Kolloidnyy zhurnal, v. 28, no. 2, 1966, 229-233

TOPIC TAGS: natural rubber, gel, solid mechanical property, solid physical property

ABSTRACT: Samples of pale crepe rubber were extracted with hot acetone in darkness for 6 to 18 hr, then dried and plasticized in an environment devoid of free radical acceptors, to induce the formation of an insoluble gel 7 (20 to 30% after 10 min). Also, samples of rubber vulcanized according to two different methods for 5 or 30 min at 143C were deformed on a rupture tester 6 at 500 mm/min. Results indicate that the gel breaks down as plasticizing is prolonged and a microgel forms. The latter is capable of spontaneous dissolution. Since the mean molecular weight of the microgel-containing rubber is greater and its intrinsic viscosity is lower than those of the source material, the authors conclude that the microgel represents

Card 1/2 UDC: 541.182:541.64

L 41029-66

ACC NR: AP6022446

2

dense spherical particles of a strongly branched macromolecular spatial lattice. The presence of the microgel minimizes crystallization, so that the strength of the vulcanized rubber is reduced sharply as a result of poor compatibility with linear macromolecules, the deterioration of the peptizing environment and the increase in quantity of free macromolecular ends. In conclusion, the authors express their gratitude to workers of the department of colloidal chemistry N. M. Fodiman and A. N. Kamenskiy for performing the electron-microscopic investigations of the microgel. Orig. art. has: 1 table and 7 figures.

SUB CODE: 07/ SUBM DATE: 03May65/ ORIG REF: 002/ OTH REF: 010

Card 2/2 hs

BALASHOVA, N.A., KULEZNEVA, M.I.

Mechanism of the effect of bivalent cations on the electroreduction of oxygen on platinum. Elektrokhimiia 1 no.2:155-158 F '65. (MIRA 18:6)

1. Institut elektrokhimii AN SSSR.

KAZARINOV, V.Ye.; BALASHOVA, N.A.; KULEZNEVA, M.I.

Structure of the surface layer on platinum in alkaline solutions. Elektrokhimiia 1 no.8:975-978 Ag '65. (MIRA 18:9)

1. Institut elektrokhimii AN SSSR.

KUL'GA, V.

And there was a clap of thunder.... Grazhd. av. 22 no.2:9 F '65. (MIRA 18:5)

1. Sekretar' komiteta kommunisticheskogo soyuza molodezhi Krasnovodskogo aeroporta.

[illegible] [illegible]gadov, A. A., 44,5 (Active member.; Kul'gachev, A. [illegible] Active member:

[illegible]

42
E

KUL'GACHEV, L., inzhener.

The building of houses of the semiopen type for fattening hogs is on the increase. Sel'.stroi. 11 no.3:3-4 Mr '56. (MIRA 9:7)

1.Kamenskoye oblstnoye upravleniye po stroitel'stvu v kolkhozakh. (Swine houses and equipment)

KULGANEK, V.; KLASHKA, V.

Simplified determination of aldolase activity in the blood serum. Vop. med. khim. 7 no.4:434-437 Jl-Ag '61. (MIRA 15:3)

1. Research Institute of Traumatology and the II Polyclinic, Brno, Czechoslovakia.

(ALDOLASE)

KULGASHEV, A.I.

Vozdvizhenska deposit. Trudy IGEM no.83:359-368 '63.
(MIRA 16:11)

69083

S/120/60/000/01/023/051
E192/E382

'9.2580

AUTHORS: Kul'gavchuk, V.M. and Protopopov, N.A.

TITLE: A Generator of Powerful Pulse Currents

PERIODICAL: Pribory i tekhnika eksperimenta, 1960, Nr 1, pp 85 - 89 (USSR)

ABSTRACT: It is shown theoretically that by employing a delay line it is possible to obtain current pulses having a shorter rise time than the pulses which can be obtained by discharging a capacitor. A pulse generator, based on the former system was constructed. The basic elements of the system are shown in Figure 2. In order to obtain a very low characteristic impedance (about 0.2Ω), a set of coaxial lines employing 400 segments of the coaxial cable type RK-3, connected in parallel, was employed. The operating voltage of the cable was 5.5 kV. However, this could be increased up to 100 kV since the voltages were of short duration. In order to eliminate the possibility of the appearance of a corona at the open ends of the line in the generator, the coaxial cable sections having a length of 20 m were formed into loops, whose terminals

4

Card1/4

69083
S/120/60/000/01/023/051
E192/E382

A Generator of Powerful Pulse Currents

were connected to a common collector (see 2 in Figure 2). Such a loop is equivalent to two open-circuited lines having a length of 10 m, which are connected in parallel. The pulse obtained with such a line is 10^{-7} sec. Each loop is wound on a separate spool and fifty of these are assembled on a single stand. Each stand is enclosed in a metal screen, as is shown in Figure 3. The collector of the line sections (see Figure 2) is in the form of a metal-base plate having 408 apertures. A high-voltage discharge electrode 5 is fixed to the collector on a plexiglass insulator. Such a construction of the collector results in the reduction of its inductance to 3×10^{-8} H . In order to measure the current and voltage pulses of the generator, a special system was employed. This permitted the transmission of the current pulses with the rise times of 10^{-8} sec and voltage pulses with a rise time of 10^{-9} sec; it was also possible to delay the pulses by

4

Card2/4

69083

S/120/60/000/01/023/051
A Generator of Powerful Pulse Currents E192/E382

0.2 µs before applying them to the oscillograph. The current was measured by employing the Rogowski cylinder from which the voltage was collected by a cable having a length of 40 m. The voltage pulses were also measured oscillographically and a special capacity potential divider was employed for the purpose. The diagram of the divider is shown in Figure 5 and its mechanical construction is illustrated in Figure 6. An example of the oscillographic recordings of current and voltage is given in Figure 7; these were obtained during the "explosion" of a copper wire, having a diameter of 0.1 mm and a length of 25 mm, the voltage being 19 kV. The generator was tested in the short-circuit condition as well as with a matched load. In the short-circuit test the generator produced current pulses of 0.3 µs duration with the maximum current of 250 kA. A typical oscillogram of the current in this test is shown in Figure 8. The generator was employed for the investigation of the electrical explosion of conducting wires.

Card3/4

69083

S/120/60/000/01/023/051
E192/E382

A Generator of Powerful Pulse Currents

The authors express gratitude to A.A. Bezrukov and Yu.K.Gundorov for help in the construction of the generator and also to F.V..Kashin for help in carrying out the experiments. There are 8 figures and 6 references, 1 of which is English, 1 German and 4 are Soviet.

4

SUBMITTED: December 17, 1958

Card 4/4

PROTOPOPOV, N.A.; KUL'GAVCHUK, V.M.

Pulse method of determining sublimation energy in metals and alloys. Inzh.fiz.zhur. 4 no.7:84-90 Jl '61. (MIRA 14:8)
(Sublimation (Physical sciences)) (Oscillography)

S/170/61/004/009/012/013
B104/B125

AUTHORS: Protopopov, N. A., Kul'gavchuk, V. M.

TITLE: Determination of the sublimation energy of the system Pd-H by a pulse method

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, v. 4, no. 9, 1961, 102-103

TEXT: The authors determined the integral sublimation energy of the system Pd-H. For this purpose, they developed a pulse method which relies on the determination of the energy limit of the current interruption that is caused by pulse heating. That means that the minimum energy required for a complete evaporation of the test specimen is to be determined. The experimental arrangement was described in a previous paper of the authors ("Pribory i tekhnika eksperimenta", no. 1, 85, 1960). In order to ensure the necessary current-pulse duration in the discharge circuit of the arrangement, an additional coil having an inductance of 1.4μ h was used. With the aid of such an arrangement, it is possible to heat a palladium specimen electrolytically saturated with hydrogen when sending a current

Card 1/3

pulse through it. The sublimation energy is calculated from the time of current interruption which occurs as soon as a certain maximum current strength has been attained. The specimens wires were 0.1 mm in diameter and 25 mm in length. The sublimation energy was calculated from the current and voltage oscillograms which had been photographed from the screen of an oscilloscope. An analyse of this oscillogram showed that in the α-phase ($0 \leqslant C \leqslant 0.03$; $C = H/Pd$), the sublimation energy is sharply diminished with increasing hydrogen content ($dE/dC = 400$ kcal/gram-atom). dE/dC vanishes when the β-phase appears ($0.23 \leqslant C \leqslant 0.46$). Here, the sublimation energy amounts to 56 kcal/gram-atom of Pd. With a further rise of the hydrogen content, the sublimation energy again increases, and it amounts to 69 kcal/gram-atom of Pd at $C = 0.78$. According to numerical evaluations, the decrease of sublimation energy in the α-phase from 100 to 88 kcal cannot be attributed to an increase of the lattice parameters. Furthermore, the β-phase is more stable than the mixed one (α + β). F. V. Kashin and A. V. Zakharova are thanked for assistance in experiments. There are 1 figure and 5 references: 4 Soviet and 1 non-Soviet. The reference to an English-language publication reads as follows: Smith D. P.,

S/170/61/004/009/012/013
B104/B125

Determination of the sublimation...

Hydrogen in Metals. The University of Chicago Press. Chicago, 1948.

SUBMITTED: April 3, 1961

✓

Card 3/3

89361

S/089/61/010/002/011/[illegible]
B102/B209

26.2211

AUTHORS: Protopopov, N. A., Shishkin, Yu. B., Kul'gavchuk, V. M., Sobolev, V. I.

TITLE: The technique of investigating the processes of slowing down fission fragments in metals and alloys

PERIODICAL: Atomnaya energiya, v. 10, no. 2, 1961, 166-168

TEXT: The problems of slowing down fission fragments which are important for the production of fuel elements have so far not been investigated sufficiently, and, above all, data for metals and alloys that are used in the production of fuel elements are not available. But just this case is free from difficulties of identifying the fragments. The specific energy losses and ranges of the fragments may be determined immediately by experiments. In order to solve this open problem it is sufficient to know the specific energy losses of the fragments as depending on their range. Fig. 1A shows a schematic diagram of the experimental arrangement for the investigation of U^{235} fission fragment penetration into metals and alloys. The principal

X

Card 1/4

89361

S/089/61/010/002/011/018
B102/B209

The technique of ...

part is an ionization fission chamber. The pulses generated in both canals of the chamber reach, via the amplifiers I and III, the double-coincidence circuit II (time resolution 0.5 μsec). The pulses are counted in IV by a mechanical counting device. The fission chamber is brass filled with argon and sealed hermetically. It contains the following: 1) a U_3O_8 preparation (90% U^{235}, ~0.1 mg/cm^2) upon an Al foil (0.4 mg/cm^2), 2) collimators, 3) a set of differently thick foils of the metal to be examined, 4) collector electrodes. Collimator thickness and argon pressure (~100 mm Hg) were chosen so as to keep the fragment energy losses in the collimator negligibly low. This arrangement excludes counting of spurious pulses (from γ-quanta or recoil nuclei); all measurements may be carried out at the reactor at a thermal neutron flux of between 10^6 and 10^8 n/cm^2 sec. In order to illustrate the operation of the device, the determination of the ranges and specific energy losses for fragments with equal range is discussed. Zero thickness of the material in which the range is to be examined gives rise to N_0 coinciding pulses. The number of coincidences decreases if d rises for the same amount in each of the channels. At a certain $d = d_c$, the num-

89361

The technique of ...

S/089/61/010/002/011/018
B102/B209

ber of coincidences becomes zero or drops to a minute fraction (α) of N_o, according to the sensitivity of the detector; thus, d_c characterizes the range of the fragments. The specific energy losses are determined as follows: Foil sets with $d = d_c$ of a material whose range dependence of the specific losses is known are inserted into both canals. Then, in one canal all foils, one after the other, are replaced by foils of the material to be examined; on this occasion, these foils must have such a thickness that the number of pulses does not vary on exchange. In this way the specific energy losses can be determined for all ranges. Range and specific energy loss of heavy and light fragments may be determined separately, too. For this purpose, N_o is determined as before, then the foils to be investigated are successively removed from one canal until the number of coincidences becomes small with respect to N_o. By this processing, the fragments of maximum range are separated. Then, the foils from the second canal are successively removed until the number of coincidences is equal to zero. The number of foils in the second canal now characterizes the range of the heavy fragments. The energy losses are determined analogously. Finally, the yield-to-range curves for Au and Al as determined by this method are compared

Card 3/4

89361

The technique of ...

S/089/61/010/002/011/018
B102/B209

with the results of other authors. Agreement with Ref. 2 is not good; it is good, however, with Ref. 4. There are 4 figures and 5 references: 3 Soviet-bloc and 2 non-Soviet-bloc.

SUBMITTED: November 21, 1959

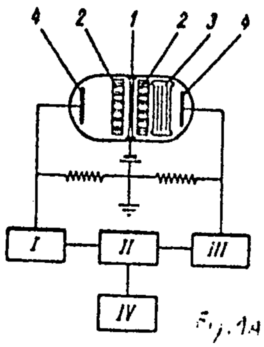


Fig. 1a

Card 4/4

22110

S/057/61/031/005/007/020
B104/B205

26.2311

AUTHORS: Protopopov, N. A. and Kul'gavchuk, V. M.

TITLE: Occurrence of current flow interruptions and formation of shock waves in rapid heating of metal by electric pulses of high current density

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 5, 1961, 557-564

TEXT: The behavior of metals at high temperatures and pressures can be studied by heating the material with current pulses. The maximum temperature obtainable in this way is 63000°C. Further increase of temperature is limited by a momentary interruption of the current flow into the metal, which also stops the input of energy. The authors studied the explosive melting of metals, which is caused by current pulses. The duration of the initial pulse varied from $2 \cdot 10^{-7}$ to $1.5 \cdot 10^{-6}$ sec, and the total duration of the experiment did not exceed 4 µsec. The study included the mechanisms of metal heating, of the occurrence of current flow interruptions, and of the formation of shock

Card 1/6

Occurrence of...

22776
S/057/61/031/005/007/020
B104/B205

waves and light flashes of optical emission. Theoretical considerations are based on the assumption that a metal is a system of particles interacting through their Coulomb forces. The mechanism of metal evaporation by current is discussed on a kinetic basis. The occurrence of current interruptions is ascribed to the sharp decrease of binding forces caused by the enlargement of the lattice distance. Thus, the conduction electrons undergo a process that is reverse to the "collectivization" occurring during the condensation of metal vapor. This process is called "decollectivization", and is regarded as the cause of the loss of conductivity and, consequently, of the current interruption. The authors examined the rate of development of current interruptions for a metal into which not more than the sublimation energy was introduced. It could be shown that the sublimation energy is the minimum required for the occurrence of current interruptions. Table 1 contains the minimum values of energy introduced into various metals, at which current interruptions still occur. An investigation of the current drop during a current interruption at different rates of energy supply can give valuable information on such gasdynamic quantities as the velocity of rarefaction waves, the velocity of the "decollectivization" front, etc. Fig. 2 shows oscillograms of current (a) and voltage (b) at the wire, as well as light flashes (c). The diagram (d) graphically shows the energy supply in the first phase of explosion of a copper wire at a voltage of 18.5 kw. It is shown that temperature increases with decreasing velocity of rarefaction waves, i.e., higher temperatures are reached in metals in which the velocity of sound is low. Next, the authors investigate the energy released by loading a circuit consisting of the variable parameters R(t) and L(t), which is practically an unknown quantity. Finally, it is shown that the physical parameters of the metals examined have an essential influence on the development of current interruptions (Fig. 5). The absence of current interruptions in tungsten, tantalum, molybdenum, and zirconium, observed in experiments in air, is ascribed to their strong thermionic emission, which causes conduction on the surface of the specimens. For comparison, experiments were made in air and with specimens sealed in glass, which support this opinion (Fig. 6). A. A. Bezrukov and F. V. Kashin are thanked for a number of experiments. There are 6 figures, 1 table, and 9 references: 3 Soviet-bloc and 6 non-Soviet-bloc.

SUBMITTED: June 16, 1960

KUL'GAVCHUK, V.M.

Kinetics of the pulse heating of the Pd - H system. Zhur.fiz. khim. 36 no.8:1713-1716 Ag '62. (MIRA 15:8)
(Palladium--Hydrogen content) (Heat of fusion)

termining the speed of the introduction of energy into the metal, and consequently also the duration of the heating process, is the [illegible] of the current increase system because of the sublimation of the more volatile component. Orig. art. has:

L 3937-66 EWT(m)/EWP(t)/EWP(k)/EWP(b)/EWA(c) JD/HW
ACCESSION NR: AP5021919 UR/0207/65/000/004/0165/0168

AUTHOR: Kul'gavchuk, V. M. (Moscow)

53
B

TITLE: The broadening of the luminous zone during electric explosion of thick wires 4

SOURCE: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 4, 1965, 165-168

TOPIC TAGS: exploding wire, copper wire

ABSTRACT: Experiments aiming at the determination of the expanding luminous zone i wire explosions in air and of the hydrodynamic motion of the explosion products and of the surrounding air are described. The mode with the dark pause was studied and compared to a control experiment in which no dwell time was involved; the energy fe into the wire up to the moment of the pause was taken into account. The samples consisted of enamel-insulated copper wires 0.74 mm in diameter and 20 cm long. The explosions were registered by streak camera photographs and oscillograms. It follows from the obtained data that the time dependence of the square of the luminous zone diameter is a linear function, which means that the experimentally determined rule for the expansion of the zone corresponds to the model of an expanding cylindrical shock wave. The hydrodynamic motion was shown to be somewhat higher than the

Card 1/2

L 3937-66

ACCESSION NR: AP5021919

0

difference between the energy transmitted into the wire and that of sublimation. The author hopes that the measurements will be helpful in applications using shock waves in exploding wires. Orig. art. has: 2 formulas, 1 table, and 4 figures. [ZL]

ASSOCIATION: none

SUBMITTED: 16Mar64 ENCL: 00 SUB CODE: EE

NO REF SOV: 006 OTHER: 004 ATD PRESS: 4118

Card 2/2

L 23052-66 FSS-2/EWT(1)/EWT(m)/EWP(t)/EWP(k) JD/JW/HW

ACC NR: AP6011404 SOURCE CODE: UR/0057/66/036/003/0549/0556

AUTHOR: Kul'gavchuk, V. M.; Novoskol'tseva, G. A.

37

ORG: none

16 35 B

TITLE: A study of the heating and evaporation kinetics of exploding wires by the x-ray method

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 3, 1966, 549-556

TOPIC TAGS: exploding wire, electrical explosion

ABSTRACT: Simultaneous oscillographic recordings were made of the electrical parameters and the x-ray pulse in an investigation of the kinetics of heating and evaporation of copper and brass wires 5 cm long and 1.0 and 0.78 mm in diameter, respectively, exploded by high-density current. The wires were exploded in the air and in polyethylene tubes. The experiments aimed at an investigation of the causes of the "current pause" occurring after the heat-up, and the process of phase transition from liquid to vapor. The experimental arrangement made it possible to obtain x-ray photographs of the process at any instant. The time dependencies of the main parameters obtained were as follows. Current followed a roughly sinusoidal curve from zero to a maximum of about 100 ka at the 16 μsec mark, falling back to zero at about the 30 μsec mark. Voltage, which stayed at 1 to 1.5 kv during the initial period, showed a sharp upward peak of up to 8 kv at about the 20 μsec time mark. The resistance and power followed roughly the voltage curve with maxima at about

2

Card 1/3 UDC: 537.529

L 23052-66

ACC NR: AP6011404

2

0.23 ohm and 800 w, starting from near-zero after the 8 μsec time mark. The energy followed roughly the power curve, reaching a ceiling of about 3 kJ when the voltage, resistance, and power were subsiding from their maxima. Wires enclosed in polyethylene tubing displayed slightly lower values and a faster drop of the current, delayed and considerably (about 50%) lower peak values for voltage and power, a runaway rise in the case of resistance, and slightly lower and somewhat delayed values in the energy curve. The x-ray photographs showed an expansion of wire diameters by 1.48 and 1.53 times for copper and brass, occurring 1.0 and 0.2 μsec before the corresponding voltage peaks when the spent energy amounted to 4.27 and 5.5 kJ, respectively. After this the wire began to display an increasing series of transverse layers of lesser density 0.1 to 1 mm thick. On the basis of their luminosity on conventional photographs and also from the bulging of the polyethylene tubing, these layers were interpreted as arc discharges. At the instants of voltage peaks, the wire was already cut up into 1 to 5 mm pieces of solid matter, with about 15% of the metal evaporated. The process of breaking up intensified further after the peak. Other parameters calculated from the observation data were the speed and energy of expansion of the wire, and the spread of explosion products in time in the case of bare wire and wire enclosed in polyethylene tubes. The explanation of the process of disintegration of the wire into pieces was found in the variations of its initial diameter. A variation of 1% in diameter is considered sufficient to cause a considerable excess of temperature in the narrows. The faster rise of temperature in one section accelerates the process of exploding in that area, which in turn has the effect of slowing down the heating process in the adjacent cooler sections, mainly because of the vapor pressure developing in the process. Speculations regarding the

L 25052-66

ACC NR: AP6011404

O

changes in the kinetics of evaporation in the case of smaller specimen diameters and increased heating rate are presented. Smaller wire diameters would lead to finer breakup into layers. An increase of the heating rate (up to one order) would result in a more pronounced skin effect and consequently in a more even rate of evaporation along the specimen. However, a fully equal evaporation could be expected only at heating rates 2 to 3 orders higher than that used in this experiment. Orig. art. has: 6 figures. [FP]

SUB CODE: 20/ SUBM DATE: 02Mar65/ ORIG REF: 008/ OTH REF: 009/ ATD PRESS: 4234

Card 3/3 fv

L 35869-66 EWT(d)/EWT(1)/EWP(w)/EWT(m)/EWP(t)/ETI/EWP(k) IJP(c) JD/

ACC NR: AP6021218 SOURCE CODE: UR/0294/66/004/003/0419/0423

25
3

AUTHOR: Kul'gavchuk, V. M. (Moscow); Shishkin, Yu. B. (Moscow); Berezin, I. A. (Moscow)

ORG: none

TITLE: Measurement of the 21 temperature in the first stage of the electrical explosion of wires

SOURCE: Teplofizika vysokikh temperatur, v. 4, no. 3, 1966, 419-423 17

TOPIC TAGS: silver, copper, constantan, exploding wire, electric inductance, temperature measurement

ABSTRACT: The purpose of the present article is to determine the temperature in the first state of an electrical explosion as a function of the energy input into copper, silver, and constantan wires at different warm-up times. The experimental set-up consisted of a current-pulse condenser oscillator (condenser capacity, 1 μf; discharge circuit inductance without the inductance wire, 0.058 μh; and with an additional coil, 1.7 μh), two UM-2 monochromators 10 with FEU-27 photomultipliers at their outputs, cathode followers, 7 amplifiers (with 0.1-μsec rise time), and two OK-21 18 oscillographs, 10 one of which recorded the discharge circuit current and the wire voltage, and the other, the intensity of the continuous spectrum in selected sectors. The oscillator lagged 0.2 μsec behind the start of the oscillograph sweep. A panel

Card 1/4 UDC: 533.9.082.5

L 35569-66

ACC NR: AP6021218

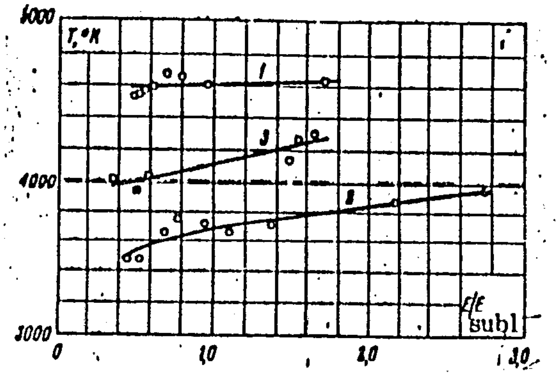
box with an input slit and a semitransparent mirror was located in front of the monochromators. Table 1 shows the energy input time (the duration of the warm-up current pulse before the appearance of the current break), and the light pulse duration (the time from the beginning of the leading edge of the pulse up to the extrapolated value of the linear segment of the trailing edge to zero level) at a discharge voltage of 7 kv. The warm-up time of the copper

Table 1. Energy input time and light pulse duration (discharge voltage = 7kv)

Specimen	Warm-Up Time μsec		Emission time, μsec		Color Temperature at $E=1.5E_{subl}$, °K	
	L_1*	L_2*	L_1	L_2	L_1	L_2
Copper 27	0.35	1.0	0.5	1.2	4600	3900
Silver 27	0.25	0.9	0.4	1.0	3700	2300
Constantan 14	0.50	0.8	0.6	1.0	4200	4200

* $L_1 = 0.058$ μh, $L_2 = 1.7$ μh.

and the silver wires increases by an order of 3 — 3.5 and that of constantan by an order of 1.6 when the discharge circuit inductance is changed from 0.058 to 1.7 μh. Such warm-up behavior is attributed to the fact that the resistance of the copper and the silver specimens is lower than the internal resistance of the oscillator, whereas the resistance of the constantan wires is greater. The dependence of the color temperature on the energy input is given in Fig. 1. It is shown that during a fast warm-up (0.25 — 0.50 μsec) the temperature rises



a

Figure 1. The color temperature of exploding wires at the peak ignition point of emission as a function of energy input.

1, 2, 3 — copper, silver, and constantan wires 0.1, 0.1, and 0.07 mm in diameter, respectively; 1a - L_d (discharge circuit inductance) = 0.058 μh; l = 11 mm; 1b - L_d = 1.7 μh, l = 44 mm.

L 35869-66

ACC NR: AP6021218

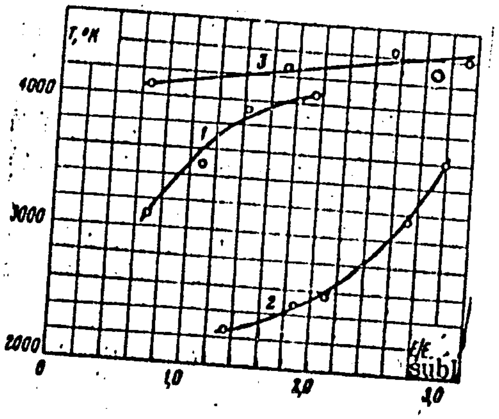


Figure 1. (b)

with an increase in the energy and reaches 4000—4700K when the input energy is equal to 1.7—3 sublimation energy. With an increase in the warm-up time (to 0.8—1 μsec) copper and silver show a faster rise in temperature with rising energy, the absolute values of the temperature, however, are lower than during a faster warm-up. Orig. art. has: 4 figures and 1 table. [26]

SUB CODE: 19,20/ SUBM DATE: 24Feb65/ ORIG REF: 007/ OTH REF: 006/
ATD PRESS: 5036

Card 4/4

KUL'GAVIY, Ya.K.; SAMOYLOV, A.A.

Making and testing a model of mesh-reinforced concrete shells of double curvature. Sbor. trud. LIIZHT no.229:147-159 '64.
(MIRA 18:8)

DEZSI, I.; HRYNKIEWICZ, A.Z.; KULGAWCZUK, D.A.

Zeeman splitting of the 14.4 keV gamma line of ^{57}Fe in $CoFe_2O_4$ investigated by the Mossbauer effect. Acta physica Pol 24 no.2:283-284 Ag '63.

1. Institute of Nuclear Physics, Krakow.

BARA, Jozef; HRYNKIEWICZ, Andrzej Z.; KULGAWCZUK, Dominik S.; LIZUREJ, Henryk

Apparatus for the investigation of the Mossbauer spectra at room temperature. Nukleonika 7 no.3:135-140 '62.

1. Institute of Nuclear Physics, Cracow and Institute of Physics, Jagiellonian University, Cracow.

HRYNKIEWICZ, A.Z.; KULGAWCZUK, D.S.

Hyperfine structure of the 14.4 keV gamma line of ^{57}Fe in some iron oxyhydroxides investigated with the Mössbauer effect. Acta physica Pol 24 no.5: 689-692 N'63.

1. Institute of Nuclear Physics, Krakow, and Institute of Physics, Jagiellonian University, Krakow.

DEZSI, I.; HRYNKIEWICZ, A. Z.; KULGAWCZUK, D. S.

Zeeman splitting of the 14.4 keV gamma line of ^{57}Fe in $CoFe_2O_4$ investigated by the Mössbauer effect.

Inst fiz jadr report no. 269: 1-3 '63

1. Instytut Fizyki Jadrowej, Krakow 23, also Central Research Institute for Physics, Budapest (for Dezsi).

HRYNKIEWIOZ, A.Z.; KUBISZ, J.; KULGAWCZUK, D.S.

Quadrupole splitting of the 14.4 keV gamma line of ^{57}Fe in iron sulfates of the jarosite group. Inst.fiz.jadr report no.301: 1-9 '63.

1. Department of Mineralogy and Petrology, School of Mining and Metallurgy, Krakow, and Institute of Nuclear Physics, Krakow.

KULGAWCZUK, Irena

Ability of the kestrel, Falco tinnunculus L., to distinguish colors . Prace zool no.6:217-233 '62.

1. Institute of Animal Psychology and Ethology, Jagiellonian University, Krakow. Head: prof. dr R.J. Wojtusiak.

KULGAWCZYK, Dominik

Luminescence centers applied to scintillation counters. Postepy fizyki no.3:305-326 '60.

1. Instytut Fizyki Uniwersytetu Jagiellonskiego, Krakow.

(2)

ACC NR: AP6005347 SOURCE CODE: UR/0413/66/000/001/0092/0092

AUTHORS: Baryshnikov, G. P.; Gushchin, N. L.; Kovalenko, Yu. V.; Lerner, B. L.; Sarkisov, S. S.; Shekhter, Z. Kh.; Kul'gin, I. Ye.

29

B

ORG: none

TITLE: Device for automatic processing of primary seismic data. Class 42, No. 177639

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, 1, 1966, 92

TOPIC TAGS: seismograph, automatic data processing

ABSTRACT: This Author Certificate presents a device for automatic processing of primary seismic data. The device consists of drums for recording seismograms, magnetic heads, and a magnetic head transport unit. To simplify the design and to increase the efficiency of seismogram processing, the magnetic head transport unit is in the form of a cam system connected to a step drive and mounted on a common shaft (see Fig. 1). The shaft is turned quasi-discretely at the end of each rotation of the recording drum. To vary the center of the summation base line, the middle cam of the system is mounted opposite the magnetic head selected as the center of the summation base line.

Card 1/2 UDC: 550.340.8

L 42068-66

ACC NR: AP6005347

0

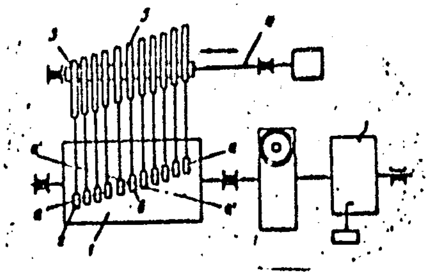
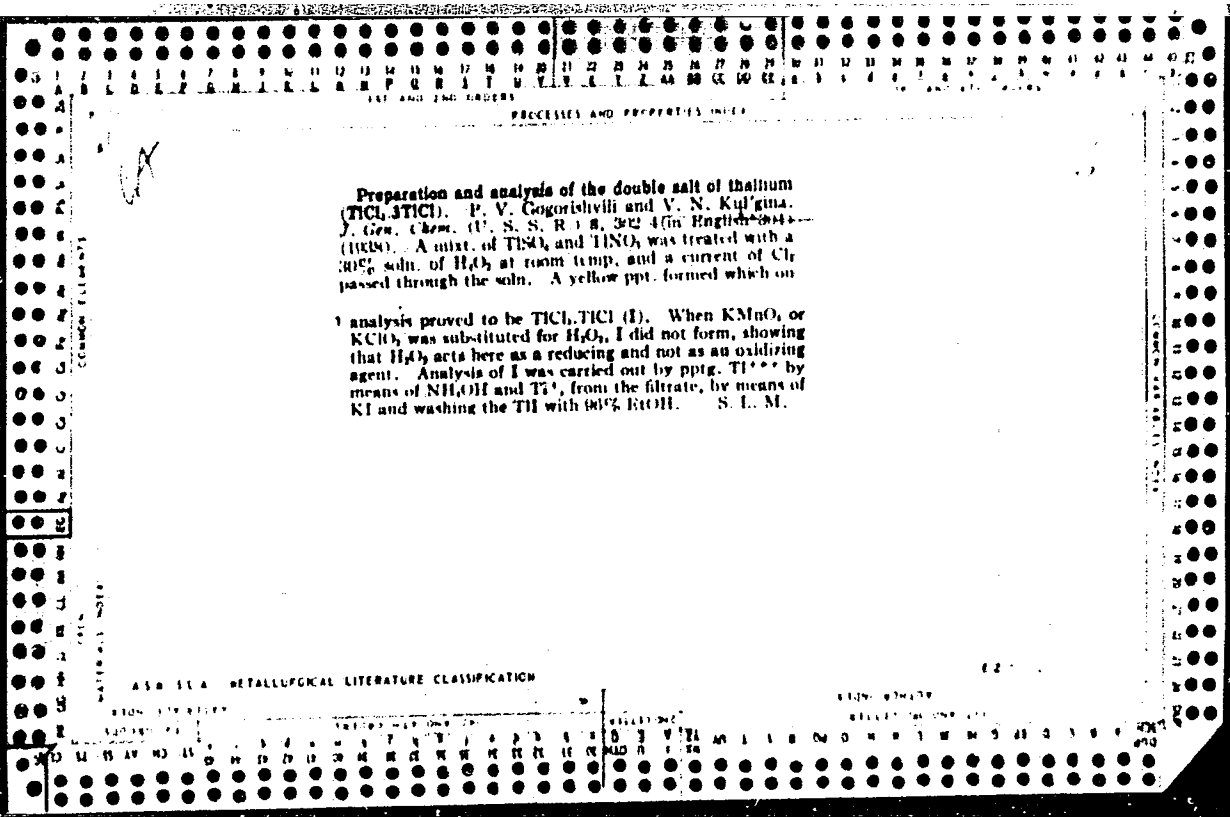


Fig. 1. 1 - drums for recording seismograms; 2 - magnetic heads; 3 - cam system; 4 - shaft; 5 - middle cam of system; 6 - magnetic head selected as center of summation base line; a-a' - summation base line

Orig. art. has: 1 figure.

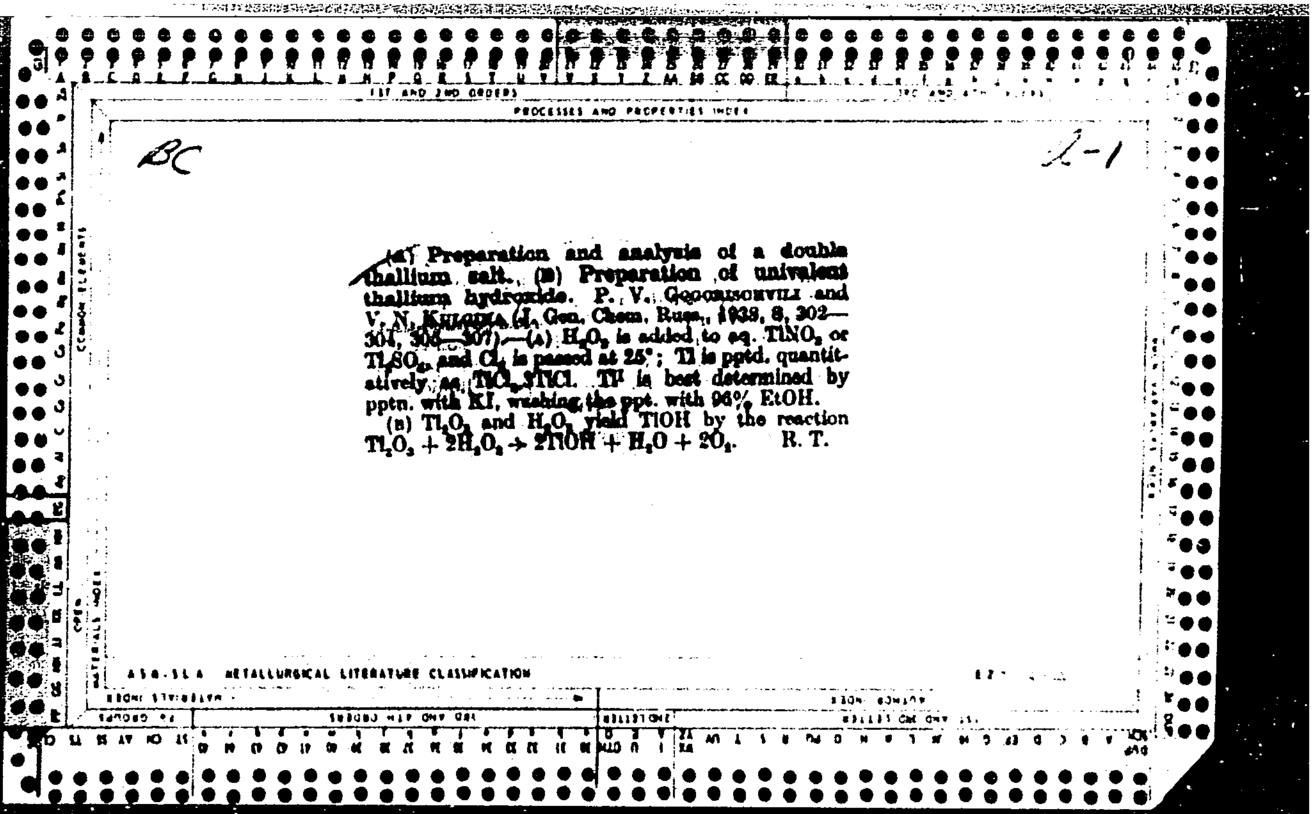
SUB CODE: 08/ SUBM DATE: 24Sep64

Card 2/2 af



1ST AND 2ND ORDERS
PROCESSES AND PROPERTIES INDEX
ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

Preparation and analysis of the double salt of thallium ($TlCl_3.3TlCl$). P. V. Gogorishvili and V. N. Kul'gina. *J. Gen. Chem.* (U. S. S. R.) 8, 392-4 (in English 394) (1938). A mixt. of Tl_2SO_4 and $TlNO_3$ was treated with a 30% soln. of H_2O_2 at room temp. and a current of Cl_2 passed through the soln. A yellow ppt. formed which on analysis proved to be $TlCl_3.TlCl$ (I). When $KMnO_4$ or $KClO_3$ was substituted for H_2O_2, I did not form, showing that H_2O_2 acts here as a reducing and not as an oxidizing agent. Analysis of I was carried out by pptg. Tl^{+++} by means of NH_4OH and Tl^+, from the filtrate, by means of KI and washing the TlI with 90% EtOH. S. L. M.



1ST AND 2ND ORDERS
PROCESSES AND PROPERTIES INDEX

BC

2-1

(A) **Preparation and analysis of a double thallium salt. (B) Preparation of univalent thallium hydroxide.** P. V. GOGORISHVILI and V. N. KHLOPINA (J. Gen. Chem. Russ., 1938, 8, 302—304, 305—307).—(A) H_2O_2 is added to aq. $TlNO_3$ or Tl_2SO_4, and Cl_2 is passed at 25°; Tl is pptd. quantitatively as $TlCl_3,3TlCl$. Tl^I is best determined by pptn. with KI, washing the ppt. with 96% EtOH.

(B) Tl_2O_3 and H_2O_2 yield TlOH by the reaction $Tl_2O_3 + 2H_2O_2 \rightarrow 2TlOH + H_2O + 2O_2$. R. T.

CA

6

The higher oxygen compounds of iron. P. V. Gogorishvili, V. N. Kul'gina and O. R. Zvyagintsev. *J. Gen. Chem.* (U. S. S. R.) 9, 1061-6(1939). The prepn. of salts of a higher Fe acid according to the method of Goralevich (*C. A.* 22, 1204) by fusing Fe_2O_3 with $KClO_3$ and KOH, as well as by the action of Na_2O_2 and $KClO_3$, was investigated. A green film on the surface of the melt was obtained. The optimum temp. for obtaining the green film was 400-70°. A bright green soln. was obtained by lixiviating the melt. The green color of the soln. was caused by the formation of the manganate. The yellowish soln. contained small amts. of Fe. A complete sepn. of Mn by repeated fusing and lixiviation of Fe_2O_3 was not accomplished. The Fe_2O_3, when pptd. with pyridine, contained almost no Mn. The supposition of Dammer and the investigations of Smith and of B. A. Petrov and Boris Ormont (*C. A.* 31, 2113⁹, 8389⁴) that the formation of the green films is caused by the presence of Mn in the compds. of Fe were verified. A no. of expts. were performed in a Au crucible; by simultaneous fusing of Na_2O_2 and $KClO_3$ with Fe_2O_3 (obtained by pptn. with ammonia) a dark sky-blue substance (I) is obtained. The spectral analysis of I showed that no Fe was present in it. An analogous expt. with Fe_2O_3 obtained by a pptn. with pyridine produced no I. This proved the absence of Mn in Fe_2O_3 when obtained by pptn. with pyridine. An oxidizing fusion produced no $MFeO_4$ salts of octavalent Fe. The salts obtained by Goralevich were not salts of octavalent Fe. The conclusions of Ormont on the difficulty of obtaining the octavalent Fe compds. as compared with the prepn. of RuO_4 and OsO_4 were verified. It is possible that expts. performed under different conditions may produce octavalent Fe compds. Eleven references and 2 tables are given. W. R. Henn

ASB-SLA METALLURGICAL LITERATURE

REBAS, A.Yu., inzh.; KULGVER, L.A., inzh.

Continuous asphalt-concrete plant with 50-60 ton per hour capacity. Avt. dor. 27 no.8:8-9 Ag '64. (MIRA 17:12)

KULHANEK, F.

M

1868. DECOMPOSITION OF SUGAR IN BOILER FEED WATERS. Kulhanek, F. (Listy cukr., 58, N_o. 31/32, 157; Dtsch. Zuckerindustr., 1940, 65, 303). The author was prompted by the excessive incidence of corrosion, and by the frequency of explosions, especially in fire-tube boilers, encountered when condensate from the evaporation of juice is used as feed water for boilers in sugar factories, to make a laboratory investigation into the behaviour of very dilute solutions of sugar when subjected to high temperatures and pressures in the presence of alkalies. To 25 c.c. samples of a 0.01 M solution of sucrose carbonate, trisodium phosphate, and a mixture of the last named with sodium hydroxide. The samples were made up to 30 c.c. with distilled water and heated in an autoclave to 160° or 170°C., the respective pressures being 6.0 and 8.6 atm. After the solutions had been colled, their alkalinity to phenol- phthalein, specific and inversion rotations, α-naphthol reaction, content of invert sugar, and colour were determined. It was found that in a sample containing sodium hydroxide and sucrose in the proportions of 2.4 to 1, the sucrose was so far decomposed by heating at 160°C. for 2 hours that the α-naphthol [redacted]

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION reaction was negative. With increased temperature, smaller amounts of alkali produced equal decomposition in shorter time. Experiments with the other alkalies gave similar results, sodium carbonate having the weakest effect and sodium hydroxide the strongest. The effect of mixtures of trisodium phosphate and sodium hydroxide was identical with that of sodium hydroxide alone. The author concludes that although the rate of decomposition of sugar in feed water varies directly with change in temperature, pressure, and quantity of alkali present, the first two factors are the more improtant, concentration of alkali exerting only a secondary influence.

W.P.R.

Losses and sources of the air blast for blast furnaces 4G
[illegible] Kulhánek (Spojené ocelárny Kladno, Czech.). *Hutnické* [illegible] A formula is given for [illegible] [illegible] due to leaks. Different blowers are [illegible] Frank [illegible]

KULHANEK, Frantisek, inz.

Standardization of steel forging ingots in Czechoslovakia.
Normalizace 11 no. 12: 377-381 D '63.

1. Vyzkumny ustav hutnictvi zeleza, Praha.

KULHANEK, J.

"Registration of trade-marks in the Albanian People's Republic." p. 17.

VYNALEZY A NORMALISACE, OCHRANNE ZNAMKY, CHRANENE VZORY. (Urad pro vynalezy a normalisac). Praha, Czechoslovakia, Vol. 3, No. 5, May 1959.

Monthly list of East European Accessions (EEAI), LC, Vol. 8, No. 8, August 1959.
Uncla.

KULHANEK, J.; FREC, A.

Staphylococcal spondylitis with compression of the cauda equina as an unusual sequel to a common injury. Rozhl. chir. 42 no.7:499-504 Jl '63.

1. Chirurgicke a neurologicke oddeleni vojenske nemocnice v Ruzomberku.

(SPONDYLITIS) (STAPH INFECTIONS)
(CAUDA EQUINA) (BRAIN ABSCESS)
(PARAPLEGIA) (NEUROSURGERY)
(CHILD)

KULHANEK, Jan

"Tools for working plastic materials" by Laszlo Sors. Reviewed by Jan Kulhanek. Stroj vyr 11 no.8:423 Ag '63.

KULHANEK, Jan

"Working tools for artificial materials" by [dr. inz.] S. Sandelowski. Reviewed by Jan Kulhanek. Stroj vyr 11 no. 12: 640-641 '63.

PETRU, Frantisek; POPELA, Bohumir; KULHANEK, Jan; CUCHY, Zdenek; BOBEK, Milan;
VITAK, Frantisek

Small infrared spectrophotometer. Chem listy 57 no.9:964-972
S '63.

1. Ustav pristrojove techniky, Ceskoslovenska akademie ved, Brno
a Vyzkumny ustav monokrystalu, Turnov.

Country : Czechoslovakia
H-29

Category= : Chemical Technology. Chemical Products and Their Applications. -- Synthetic Polymers. Plastics.

Abs, Jour. : R. Zh. - Khim., No. 11, 1959
40680

Author : Kulhanek, Jan

Institut. : Not given

Title : The Fabrication of Polyethylene by Extrusion

Orig. Pub. : Chem Prumysl, 8, No 7, 388-389 (1958)

Abstract : The author describes equipment for the fabrication of polyethylene into consumer goods by the extrusion method and discusses the effect of fabrication conditions on the quality of the articles produced. A method combining extrusion with blowing used in the production of polyethylene bottles is described.
L. Sedov

Card: 1/1

H-163

KULHANEK, Jan

"Processing of plastic materials" by Frantisek Blabolil. Reviewed by Jan Kulhanek. Stroj vyr 10 no.6:324 '62.

[illegible]

KULHANEK, L.

Oxygen cutting of stainless steel and cast iron in Czechoslovakia, p. 241, ZVARANIE, (Ministerstvo hutneho prumyslu a rudnych bani a Ministerstvo strojarstvo) Bratislava, Vol. 3, No. 8/9, Sept. 1954

SOURCE: East Eruopean Accessions List (EEAL) Library of Congress, Vol. 4, No. 12, December 1955

KULHANEK

UG **15298*** Ways of Increasing the Efficiency of Oxygen Cutting. Cesta k zvýšení produktivity kyslíkového řezání. (Czech.) L. Kulhánek. *Strojírenství*, v 5, no. 3, Mar 1955, p. 212-216.

New designs of cutting torches; technology of their manufacture; increasing economics in use of O and acetylene. Photographs, tables, diagrams.

KULHANEK, L.; DUBEN, Z.

Cutting and shaping metals with oxygen in Czechoslovakia. p. 421.

ZVARACSKY SBORNIK. (Slovenska akademic vied) Bratislava, Czechoslovakia.
Vol. 8, no. 4, 1959.

Monthly list of East European Accession (EEAI), LC Vol. 9, no. 2, Feb. 1960

Uncl.

KULHANEK, Ladislav

The RPV-2 plasma cutting machine. Zvaranie 12 no.7:201-205 Jl '63.

1. Vyzkumny ustav svarovacich stroju a technologie svarovani, Praha.

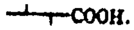
KULHANEK, M.

KULHANEK, MILOS

Chemical Abst.
Vol. 48
Apr. 10, 1954
Biological Chemistry

②

Biochemical dehydrogenations of aldonic acids. I. Biochemical dehydrogenation of hexonic acids by *Pseudomonas aeruginosa*. Miloš Kulhánek (Biochem. výzkumný ústav, Neratovice, Czech.). *Chem. Listy* 47, 1071-4(1953).—Dehydrogenating properties of 17 strains of *Ps. aeruginosa* were studied on hexonic acids. Ten strains dehydrogenated practically quantitatively up to 10% D-gluconate substrates. Only Ca 2-ketogluconate was isolated in 74% yield; no formation of 5-ketogluconate was observed. Further biochem. degradation of 2-ketogluconates led to oxalates, carbonates and H_2O. Similarly, Ca L-idonate and Ca D-galactonate gave 2-keto-L-idonic and 2-keto-D-galactonic acids in 90% and 82% yields, resp. II. Biochemical dehydrogenation of D-arabonic and α-D-glucoheptonic acids. Jindřich Liebster, Miloš Kulhánek, and Milan Tadra. *Ibid.* 1075-80.—Ammonium salts of D-arabonic acid (I) and of α-D-glucoheptonic acid (II) were subjected to biochem. dehydrogenations by *Acetobacter suboxydans*. NH_4 salt of I gave 61% *4-keto-D-arabonic acid* (III). Ca salt of III, $[\alpha]^{20}_{D}$ −29°; III, $[\alpha]^{20}_{D}$ −10.25°. Brucine salt of III, m. 154-6°, $[\alpha]^{20}_{D}$ −29.4°. Similarly, γ-lactone of II gave 54% Ca salt of X-keto-α-D-glucoheptonic acid, decahydrate, $[\alpha]^{20}_{D}$ −32°. III. Relation between the configuration and the susceptibility to dehydrogenation of aldonic acids. Miloš Kulhánek. *Ibid.* 1081-5.—From the study of 12 hexonic, pentonic and heptonic acids and various oxidation bacteria, general relations between the susceptibility to biochem. dehydrogenation and the configuration were derived. Dehydrogenations in 2-position occur only with the cultures which oxidize D-gluconate to 2-keto-D-gluconate, and on acids with configuration


$$\overset{|}{-}\underset{|}{-}\text{COOH}.$$

The only exceptions seem to be L- and D-mannonic acids. Dehydrogenation on the C atom adjacent to the alc. function occurs only with those cultures which dehydrogenate D-gluconate to 5-keto-D-gluconate, exclusively in the D-series, and only in case that the projection formula has 2 *cis* hydroxyls on the end remote from the COOH.

M. Hudlický

ELEBSTER, J.; KULHANEK, M.; TADRA, [illegible].
"Biochemical Dehydrogenation Of Aldonic Acids. Pt. 2. Biochemical Dehydrogenation Of D-Arabonic And [illegible] - Glucoheptonic Acids." p. 1075
(Chemicke Listy. Vol. 47, No. 7, July 1953, Praha.)

SO: Monthly List of East European Accessions,/Library of Congress, March 1954, Uncl. Vol. 3, No. 3.

KULHANEK, M.

"Biochemical Dehydrogenation Of Aldonic Acids. Pt. 3, Relation Between Configuration And Susceptibility To Dehydrogenation In Aldonic Acids." p. 1081. (Chemicke Listy. Vol. 47, No. 7, July 1953, Praha.)

Vol. 3, No. 3.
SO: Monthly List of East European Accessions, Library of Congress, March 1954, Uncl.

"Production of riboflavin through fermentation."
Chemicke Zvesti, Bratislava, Vol 7, No 1/2, Jan./Feb 1953, p. 57

SO: Eastern European Accessions List, Vol 3, No 1, Oct 1954, Lib. of Congress

KULHANEK, M.; SEVCIKOVA, Zdena

Biochemical dehydrogenation of saccharides. IV. Secondard products of biochemical dehydrogenation of D-sorbitol and D-mannitol. Folia microbiol. 7 no.5:288-297 '62.

1. Institute of Pharmacy and Biochemistry, Prague 3.
(SORBITOL) (MANNITOL) (ACETOBACTER)

KULHANEK, M.; TADRA, M.

Notes on preparation of 6-aminopenicillanic acid by bacterial hydrolysis of benzylpenicillin. Folia microbiol. 8 no.5:301-303 '63.

1. Institute of Pharmacy and Biochemistry, Prague 3.
(PENICILLIN G) (BACTERIA) (PENICILLIN)
(BIOCHEMISTRY)

KULHANEK, M.; SVATEK, E.; TADRA, M.

Microbiological decarboxylation of orotic acid to uracil. Folia microbiol. (Praha) 10 no.2:112-114 Mr'65.

1. Institute of Pharmacy and Biochemistry, Prague 3.

CZECHOSLOVAKIA / Chemical Technology. Leather. Fur. H-35
Gelatine. Tanning Agents. Industrial
Proteins.

Abs Jour: Ref Zhur-Khimiya, No 23, 1958, 80015.

Author : Belohradsky, F., Kotasek, Z., Kulhanek, Miroslav
Inst : Not given.
Title : The Preparation of Alkyl Sulfochlorides and Thheir Practical Application as Tanning Agents.

Orig Pub: Veda a vyzk. v. prumyslu kozedoln., 1956, 1, 103-112.

Abstract: The possibility of developing alkyl sulfochlorides suitable for tanning was studied. Although the alkyl sulfochlorides prepared from hydrocarbons C_{14}-C_{16}, which were obtained in the course of fractional distillation of petroleum, do possess tanning properties, they nevertheless have

Card 1/2

CZECHOSLOVAKIA / Chemical Technology. Leather. Fur. H-35
Gelatine. Tanning Agents. Industrial
Proteins.

Abs Jour: Ref Zhur-Khimiya, No 23, 1958, 80015.

Abstract: drawbacks which originate from the starting material. Satisfactory results were achieved when alkyl sulfochlorides were prepared from higher hydrocarbons (C_{25}-C_{30}). It was established that the leathers which underwent alkyl sulfochloride tanning are characterized by better physical chemical properties than those after fat liquoring or swede tanning. A special advantage of leathers tanned by sulfochlorides is the good white color and the resistance to sunlight.

Card 2/2

89316

Z/039/61/022/002/007/008
E192/E382

6.9000

AUTHOR: Kulhánek, Ota, Engineer

TITLE: Extension of the Statistical Linearisation to the Nonlinearities of Hysteresis Type

PERIODICAL: Slaboproudý obzor, 1961, Vol. 22, No. 2, pp. 93 - 95

TEXT: The method described is a generalisation of the methods devised by I.E. Kazakov (Ref. 1) and R.C. Booton (Ref. 2). The underlying principle of the method is the approximation of a nonlinear transformation by a certain linearised function relating random input and output of a nonlinear element; the approximation is effected in such a way that both the functions (the actual and the approximated) have the same average values and correlation functions. The method is thus based on the statistical transfer coefficients and functions which are defined by (Refs. 1, 2, 8):

4X

Card 1/7

89316

Extension of the ....

Z/039/61/022/002/007/008.
E192/E382

$$k_0 = \frac{m_y}{m_x}, \tag{1}$$

$$k_1^{(1)} = \sqrt{\frac{D_y}{D_x}} = \frac{\sigma_y}{\sigma_x}, \tag{2}$$

$$k_1^{(2)} = \frac{1}{D_x}\int_{-\infty}^{\infty} (x - m_x)\, f(x) w_x \, dx, \tag{3}$$

where k_o, $k_1^{(1)}$, $k_1^{(2)}$ are statistical transfer coefficients of the DC or AC components of a random signal,

m_x, m_y are mean values of the random signal,

σ_x, σ_y are the root mean square deviations of the signal.

In practice, the quantities m_x and σ_y are determined as the first or the second statistical moments. These are defined by:

Card 2/7

89316

Extension of the Z/039/61/022/002/007/008
E192/E382

$$m_y = \int_{-\infty}^{\infty} f(x)w_x \, dx, \qquad (4)$$

$$D_y = \int_{-\infty}^{\infty} f^2(x)w_x \, dx - m_y^2, \qquad (5)$$

where the function f represents a nonlinear transformation corresponding to the characteristic of the nonlinear element, and ω_x is the probability density of the random input quantity $x(t)$. The above equations are valid in those intervals where the nonlinear characteristics are single-valued and cannot be applied to hysteresis-type nonlinearities. However, if the distribution of the random input signal is symmetrical, the integral of Eq. (3) can be written as:

$$m_y = \int_a^b \frac{1}{2} \left[f_1(x) + f_2(x)\right] \omega_x dx \qquad (7).$$

Card 3/7

The limits a, b define the interval where the functions are not single-valued, i.e. the functions $f_1(x)$ and $f_2(x)$ relate to the upper or lower branches of the characteristic. It is seen, therefore, that a hysteresis-type characteristic can be replaced by a single-valued characteristic (compare Figs. 1 and 2). Thus, if a circuit contains a nonlinear element of the hysteresis type (as shown in Fig. 1), the statistical transfer coefficient k_o can be determined from Eq. (7), which is written as:

$$m_y = -L\int_{-\infty}^{-a} \omega_x dx + \frac{1}{2}(-L + L)\int_{-a}^{a} \omega_x dx = L\int_{a}^{\infty} \omega_x dx \qquad (8).$$

The solution of this equation leads to:

$$k_0 = \frac{m_y}{m_x} = \frac{L}{m_x}\left[\Phi\left(\frac{a + m_x}{\sigma_x}\right) - \Phi\left(\frac{a - m_x}{\sigma_x}\right)\right] = \frac{L}{m_x}\varphi_{00} \qquad (9).$$

In this, φ_{00} is a normalised statistical transfer coefficient of the nonlinear element. In the same way, it is possible to determine the coefficient $k_1^{(1)}$ for the transfer of the AC component of the random signal. It is shown that this coefficient is expressed by:

$$k_1^{(1)} = \frac{\sigma_y}{\sigma_x} = \frac{L}{\sigma_x}\left[1 - \varphi_{00}^2 - \Phi\left(\frac{a + m_x}{\sigma_x}\right) - \Phi\left(\frac{a - m_x}{\sigma_x}\right)\right]^{1/2} = \frac{L}{\sigma_x}\cdot\varphi_{10}^{(1)}, \qquad (17);$$

Z/039/61/022/002/007/008
E192/E382

Extension of the ....

Finally, the coefficient $k_1^{(2)}$ is given by:

$$k_1^{(2)} = \frac{L}{\sigma_s 2\pi}\left\{\exp-\left[\frac{1}{2}\left(\frac{a-m_s}{\sigma_s}\right)^2\right]+\exp-\left[\frac{1}{2}\left(\frac{a+m_s}{\sigma_s}\right)^2\right]\right\}- - \frac{L}{\sigma_s}\cdot\varphi_{10}^{(2)}. \quad (19)$$

The above method can be used to determine the transfer of a random signal through a nonlinear control system, where the nonlinear element can have an arbitrary characteristic (not necessarily single-valued).
There are 6 figures and 7 references: 2 Czech and 5 non-Czech.

ASSOCIATION: Vysoká škola dopravní (Transport College)

SUBMITTED: November 16, 1959

Card 6/7

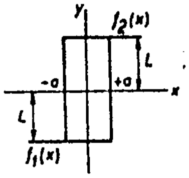
89316

Z/039/61/022/002/007/006
E192/E382

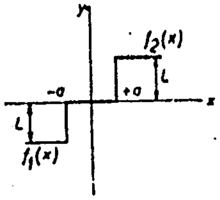
Extension of the ....

Fig. 1:

Fig. 2:



Obr. 1. **Charakteristika nelineárního členu.**



Obr. 2. **Charakteristika nelineárního členu.**

Card 7/7

KULHANEK, O.

Analogue digital computers for fast recording systems.
Slaboproudy obzor 22 no.10:636 0 '61.

KULHANEK, O., inz.

Stroboscopic method for digital reading. Slaboproudy obzor 23 no.1:56-57 Ja '62.

KULHANEK, O.

Electric furnace control. Slaboproudy obzor 23 no.6:358-359
Je '62.

KULHANEK, O.

A new fast memory computer. Slaboproudy obzor 23 no.9:534 S '62.

KULHANEK, O.

Analysis of nonlinear systems with incidental signals.
Slaboproudy obzor 24 no.4:238-240 Ap '63.

KULHANEK, O.

Statistical selection of reliable values. Automatizace 6 no.11: 287-288 N '63.

KULHANEK, O.

Method of formation of noncorrelated incidental signals.
Slaboproudy obzor 25 no.1.48-50 Ja'64.